

REMARKS

The present amendment is intended to be fully responsive to the Non-Final Office Action having a mailing date of June 1, 2007 wherein Claims 1-7, 9-16, 18 and 19 have been rejected. Claims 8 and 17 have been deemed allowable but are objected to for being dependant upon claims which have been rejected.

By this amendment, Claims 8, 14, and 17 have been cancelled; Claims 1-5, 7, 9-13, 15, 16, 18 and 19 have been amended; and claims 20-29 have been added. By this amendment Claims 1-7, 9-13, 15, 16 and 18-29 are now pending. Applicants submit that no new matter has been added by this amendment. Support for the claims, as amended, and for the amendments to the specification and drawings may be found throughout the specification, drawings, and claims as originally presented.

Applicants respectfully request reconsideration of the presently pending claims in light of the following arguments. In view of these arguments, all claims are believed to be in condition for allowance over the prior art of record. Therefore, this response is believed to be a complete response to the Office Action. However, Applicants believe that there are also reasons other than those set forth below why the pending claims are patentable. Applicants therefore reserve the right to set forth further arguments supporting the patentability of their claims, including the separate patentability of the dependent claims not explicitly addressed herein, in future papers. Further, for any instances in which the Examiner took Official Notice in the Office Action, Applicants expressly do not acquiesce to the taking of Official Notice, and respectfully request that the Examiner provide an affidavit to support the Official Notice taken in the next Office Action, as required by 37 CFR 1.104(d)(2) and MPEP § 2144.03.

Allowability of Claims 8 and 17

Applicants wish to thank the Examiner for indicating the allowability of Claims 8 and 17. While Applicant is appreciative of the indication of allowable subject matter in these claims,

Claims 8 and 17 have been cancelled in the above amendment in view of the other amendments made to the claims on which Claims 8 and 17 previously depended.

Amendments to the Claims for Matters of Format

The present application is based on a priority document that included certain reference numerals in the claim. By this amendment, the reference numerals and letters 16, 28, 49 and THL are removed from the Claims 1, 3-5, 7, 9, 10, 12, 13, 16, 18 and 19 to place them in proper U.S. claiming format, to conform to U.S. practice and to make it clear that the scope of the claims are not intended to be limited to the specific example of structure associated with any reference numeral or letter in the specification or drawing.

35 U.S.C. § 102

Claims 1, 2, 4-6, 10, 11, 13, 15 and 19 are rejected under 35U.S.C. 102(b) as being anticipated by Wheeler et al., (U.S. 6,445,992). Applicant respectfully traverses the rejection in view of the amendments presented above and the arguments presented below.

Rejection of Claims 1 and 10 Using *Wheeler*

Independent Claim 1, as currently amended, claims a “vehicle master clutch engagement method, comprising the steps of: determining a throttle operating parameter value; and setting an operating mode of the clutch based on the throttle operating parameter value.”

Independent Claim 10, as currently amended, claims a “control system for engaging a vehicular master clutch that comprises an electronic control unit for receiving signals corresponding to a throttle operating parameter value, the electronic control unit setting an operating mode of the clutch based on the throttle operating parameter value.”

To anticipate a claim, the reference must teach every element of the claim. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*,

814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the ... claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Therefore, to anticipate Claims 1 and 10, Wheeler would have to expressly or inherently describe or show a method or system where an operating mode of a clutch is set based on a throttle operating parameter. It is respectfully submitted that Wheeler nowhere teaches or even suggests such a method or such a system. Wheeler explicitly teaches engaging the clutch on the basis of an actual measurement of engine torque plus the condition of the brake pedal. The actual engine torque is determined by the thermodynamics of the engine. While the actual engine torque at any time is regulated by the operation of the throttle, the throttle condition is not used to determine the any operational mode of the clutch.

In the rejection, the Examiner states that “Wheeler et al., discloses a clutch control determining a throttle operating parameter (THL), comparing the value to a threshold value (first reference value), setting an operating mode of the clutch based on the throttle comparison (command clutch to engage), the parameter value corresponds to a throttle position, determining a vehicle operating condition (vehicle speed), comparing the condition to a predetermined limit (second reference value) and setting the operating mode based on the comparison (Figure 4), an electronic control unit (34) receives signals for the throttle parameter and controls the operating mode of the clutch, determining a desired fueling rate of the engine (a fuel rate is controlled by the throttle position which has a predetermined value (first reference value)) and setting the engagement rate of the clutch based on the desired rate (engagement will have the same torque transfer capacities as the drive torque)” [Official Action, page 2, starting on line 18]

Applicants respectfully disagree. Wheeler neither teaches nor suggests using a throttle operating parameter value to set an operating mode for the clutch to use. Instead, Wheeler uses torque information to determine the engine conditions under which the clutch will engage. [Wheeler col. 1 lines 47-54] In Wheeler, the throttle operating parameter is used to set an idle drive torque value T_{idle} . The clutch is commanded to engage when torque capacity = T_{idle} . [See for

example Fig. 4 of Wheeler] Thus, the throttle operating condition will indirectly influence the timing of clutch engagement, along with numerous other factors relating to the engine operation. However, this does not set an operating mode for the clutch. For example, Wheeler neither teaches nor suggests that the clutch engage or disengage in a more or less aggressive fashion. Furthermore, Wheeler nowhere suggests setting an operating mode, as claimed in claims 1 and 10 but instead contemplates a single operational mode – engagement of the clutch - regardless of any throttle operating parameter. Therefore, Wheeler can neither teach nor suggest setting an operating mode for the clutch based upon a throttle operating parameter but instead merely teaches that the clutch is to engage or not engage based on a torque parameter which is in small part the result of a throttle condition.

Accordingly, the teachings of Wheeler do not anticipate Claims 1 and 10.

Rejection of Claim 5 Using *Wheeler*

Independent Claim 5, as currently amended, claims a “A vehicle master clutch engagement method, comprising the steps of: determining a throttle operating parameter value; comparing the throttle operating parameter value to a first threshold value; and setting an operating mode of the clutch based on the comparison step at a first rate when the throttle operating parameter value is less than the first threshold value; and at a second rate more aggressive than the first rate when the throttle operating parameter value is greater than the first threshold value.”

As presented above, Wheeler neither teaches nor suggests setting an operating mode for a clutch based on the comparison between a threshold throttle operating parameter value and a first threshold value. Furthermore, Wheeler no where teaches or suggests having operating modes set at two different operating rates.

Wheeler therefore cannot anticipate setting an operating mode at a first rate when selecting between the two operating rates based on the comparison of a throttle operating parameter and a first threshold value as claimed in Claim 5.

Rejection of Claim 19 Using *Wheeler*

Independent claim 19, as currently amended, claims a “vehicle master clutch engagement method for use with a vehicle that includes a fuel controlled engine, a master clutch and a transmission, the method comprising the steps of: determining a desired fueling rate of the engine; and setting an engagement rate of the clutch based on the desired fueling rate of the engine.”

Wheeler nowhere suggests setting an engagement rate of the clutch based on a fueling rate. Wheeler sets a target idle torque value based on a throttle value as well as several other inputs such as the status of the brake pedal and the parking brake. The fueling rate is determined by a controller to obtain the desired torque level [Wheeler col. 3 lines 23-25]. Subsequently, the control seeks to engage the clutch at the desired level of engine torque. This places a load on the engine and the output torque will drop, resulting in a command to increase the fueling rate so as to maintain the desired torque. [col.5, lines 5-24] Thus, Wheeler teaches that the fueling rate and clutch engagement timing responds to the torque conditions. However, Wheeler nowhere teaches or suggests adjusting the clutch engagement rate, as claimed in claim 19, based on the desired fueling rate of the engine.

Accordingly, the teachings of Wheeler can not anticipate claim 19.

Patentability of Independent Claim 24 over *Wheeler*

New independent Claim 24 claims a control system for engaging a master clutch wherein the control sets an operating mode based on a comparison between a throttle operating parameter value and a first threshold value. As presented above, Wheeler does not teach or suggest setting an operational mode based on a throttle operating parameter. Claim 24 further claims engaging the clutch at a more aggressive rate when a throttle operating parameter is greater than a threshold value. As presented above, Wheeler nowhere teaches or suggests controlling the clutch engagement rate based on a throttle operating parameter.

Wheeler cannot anticipate claim 24 for the reasons presented above.

Rejection of Claims 2, 4, 6, 11, 13 and 15 Using *Wheeler*

For the reasons presented above, independent Claims 1, 5, 10, 19 and 24 are each patentable over Wheeler. Dependent Claims 2-4, 6-7, 9, 11-13, 15, 16, 18, 20-23 and 25-29 are also patentable over Wheeler by being dependent on an allowable base claim. Furthermore, the dependent claims also independently patentable.

For example, Claims 2 and 11 claim “the throttle operating parameter value corresponds to one of throttle application rate and acceleration of throttle application.” Wheeler nowhere discusses using throttle application rate or acceleration as a throttle operating parameter value and therefore cannot teach or suggest this recitation.

Further, Claims 3 and 12, recite “engaging the clutch at an increasingly aggressive rate when the throttle operating parameter value is increasing.” Claims 20, 26 and 28 each recite at least two clutch engagement rates, the second rate being more aggressive than the first. Claims 21 and 25 claim engaging the clutch “at a third rate when the throttle operating parameter value is greater than the second threshold value.” Wheeler nowhere discussed the relative aggressiveness of clutch operating modes and therefore can neither teach nor suggest this recitation.

Moreover, Claims 9 and 18 claim “engaging the clutch at the first rate when no throttle operating parameter value is determined.” Wheeler no where teaches or suggests an operational mode for the clutch when no throttle operating parameter is available and therefore can neither teach nor suggest this recitation.

Accordingly, Applicants submit that all claims now pending in the application are allowable over Wheeler. Applicants therefore respectfully request withdrawal of the rejection of claims 1, 2, 4-6, 10, 11, 13, 15 and 19 under 35U.S.C. 102(b) over Wheeler.

35 U.S.C. § 103

Claims 3 and 12, both amended, are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler in view of Takatori et al. (U.S. 6,743,150). Claims 7, 9, 16 and 18, each currently

amended, are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler as modified by Jarvis (U.S. 5,072,815). Applicants respectfully traverse these rejections.

Rejection of Claims 3 and 12 Using *Wheeler & Takatori*

Claim 3 depends from claim 1, which claims a “vehicle master clutch engagement method, comprising the steps of: determining a throttle operating parameter value; and setting an operating mode of the clutch based on the throttle operating parameter value.” Claim 12 depends from Claim 10, which claims a “control system for engaging a vehicular master clutch that comprises an electronic control unit for receiving signals corresponding to a throttle operating parameter value, the electronic control unit setting an operating mode of the clutch based on the throttle operating parameter value.” Claims 3 and 12 add to claims 1 and 10, respectively, the recitation that “the step of setting the operating mode is further defined by engaging the clutch at an increasingly aggressive rate when the throttle operating parameter value is increasing.”

“To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).” M.P.E.P. § 2143.03. It is respectfully submitted that neither Wheeler nor Takatori, either alone or any combination, teach or suggest such a structure and that, therefore, even when combined in any manner, these references fail to teach or suggest the claimed invention.

Applicant notes that the remarks about Wheeler above in reference to the 35 U.S.C. 102 rejection are equally applicable to this rejection. For the reasons presented earlier, Wheeler fails to teach or suggest nearly every element of claims 3 and 12. Most significantly, Wheeler fails to teach or suggest “setting an operating mode of the clutch based on a throttle operating parameter” as is required by both claims. Wheeler further fails to teach or suggest altering the aggressiveness of the rate of engagement, let alone altering the aggressiveness of the rate in response to a throttle operating parameter. The Examiner acknowledges this by stating that “Wheeler et al., discloses controlling engagement of the clutch but not at an aggressive rate when the throttle is increasing.”

Takatori is directed to the prevention of overheating of a clutch facing in a lock up clutch. The Examiner asserts that “Takatori et al., discloses controlling a lock up clutch at a rapid increase slip when a throttle parameter value increases (TVO1, TVO2 etc.).” Applicant respectfully disagrees with this description of Takatori. Takatori discloses terminating a lock up slip clutch control when a TVO increases rapidly to prevent the overheating of the clutch facing. [Takatori Abstract lines 1-13; col. 1, lines 36-48; and col.3 lines 7-14] This is not controlling the engagement of the clutch at an aggressive rate when the throttle is increasing. In fact, to the extent that Takatori might be relevant to the claimed invention, it teaches away from “engaging the clutch at an increasingly aggressive rate when the throttle operating parameter value is increasing” as claimed in Claims 3 and 12.

Therefore, neither Takatori nor Wheeler, nor any combination of these references, teaches or suggests engaging a clutch at an increasingly aggressive rate when a throttle operating parameter value is increasing, as claimed in Claims 3 and 12. Accordingly, Applicants submit that for at least this reason, these claims are allowable over Wheeler and Takatori. Applicants therefore respectfully request withdrawal of the rejection of Claims 3 and 12 under 35U.S.C. 103(a) over Wheeler in view of Takatori.

Appropriateness of combining *Wheeler & Takatori*

Applicants respectfully assert that it would not be obvious to combine Wheeler and Takatori. Wheeler and Takatori are directed to solving different problems for different clutch systems under different operating conditions. In particular, Wheeler is directed to providing an “urge to move” feel at idle conditions in a master dry clutch system. [See for example, Wheeler col. 1 lines 47-54] In contrast, Takatori is intended to reduce excessive temperature and resultant deterioration of a facing of a lock-up clutch which might otherwise occur during acceleration. [See for example Takatori col. 1 lines 32-48] Neither Wheeler nor Takatori suggests any reason for combining their teachings.

A case of obviousness requires that there be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. See MPEP § 2143; *In re Linter*, 458 F.2d 1013, 173 USPQ 560, 562 (CCPA 1972). “It can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *KSR International Co. v. Teleflex, Inc.*, 127 S.Ct. 1727, 1741 (2007).

There is no suggestion, motivation or reason in either *Wheeler* or *Takatori* or in the knowledge generally available for combining these references which clearly have address distinct problems and provide distinct teachings and requirements for solving those problems. It is inappropriate to combine these references in any manner to reject claims in the present application.

For this additional reason, it is respectfully submitted that Claims 3 and 12, as amended, are patentable over *Wheeler* and *Takatori*.

Rejection of Claims 7, 9, 16 and 18 Using *Wheeler* and *Jarvis*

Claims 7, 9, 16 and 18, each currently amended, are rejected under 35 U.S.C. 103(a) as being unpatentable over *Wheeler* as modified by *Jarvis* (U.S. 5,072,815).

Claims 7 and 9 are dependant upon currently amended claim 5, and claims 16 and 18 are dependant upon claim 24.

Claim 5 claims a vehicle master clutch engagement method, having the steps of determining a throttle operating parameter value; comparing the throttle operating parameter value to a first threshold value; and setting an operating mode of the clutch based on the comparison step. The operating mode is set at a “first rate when the throttle operating parameter value is less than the first threshold value; and at a second rate more aggressive than the first rate when the throttle operating parameter value is greater than the first threshold value.” [Emphasis Added]

Claim 24 claims a control system for engaging a vehicle master clutch, including a controller and at least one sensor for sensing at least one throttle operating parameter and providing an output signal to said controller indicative thereof. The controller determines a throttle operating parameter value based on the received output signal, compares the throttle operating parameter value to a first threshold value, and sets an operating mode of the vehicle master clutch based on the comparison between the throttle operating parameter value and the first threshold value. “The operating mode comprises engaging the clutch at a first rate when the throttle operating parameter value is less than a first threshold value and engaging the clutch at a second rate more aggressive than the first rate when the throttle operating parameter value is greater than the first threshold value.” [Emphasis Added]

Claims 7 and 16 add to claims 5 and 24, respectively, the requirement that the operating mode further includes engaging the clutch at the first rate when the throttle operating parameter value is substantially equal to the first threshold value. Claims 9 and 18 add to claims 5 and 24, respectively, the requirement that the operating mode includes engaging the clutch at the first rate when no throttle operating parameter value is determined.

“To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).” M.P.E.P. § 2143.03. It is respectfully submitted that neither Wheeler nor Jarvis, either alone or in any combination, fail to teach or suggest all of the claim recitations of claims 7, 9, 16 and 18.

Applicant notes that the remarks about Wheeler above in reference to the 35 U.S.C. 102 rejection are equally applicable to this rejection. For the reasons presented earlier, Wheeler fails to teach or suggest several aspects of claims 7, 9, 16 and 18.

For example, Wheeler fails to teach or suggest setting an operating mode of the clutch based on a throttle operating parameter as is required by these claims. Wheeler fails to teach or suggest altering the rate of engagement in response to a throttle operating parameter. The Examiner recognized this by stating that “Wheeler et al., discloses controlling engagement of the clutch but not at an aggressive rate when the throttle is increasing” and by stating that “Wheeler et al.,

discloses controlling clutch engagement, but not at a least aggressive rate when the throttle is parameter is equal to or less than a threshold.” Further, Wheeler fails to teach or suggest an operating mode of a clutch at a first rate below a first threshold level and at a second rate above the first threshold level. Thus, for the combination of Wheeler and Jarvis to obviate claims 7, 9, 16 and 18, Jarvis must teach or suggest each of these details which are not taught or suggested by Wheeler.

Jarvis is directed to a providing a system for controlling the response of a clutch and throttle to manual driver selection of a gear and to driver input at an accelerator. [See for example Jarvis Abstract lines 2-7] The Examiner states that “Jarvis (Figure 3) discloses controlling a clutch engagement wherein a clutch is at a least aggressive rate (124) when the throttle parameter is less than or substantially equal to a first threshold value (between T6 and T7, also is no throttle)” Applicant respectfully disagrees with this description of Jarvis.

Fig. 3 of Jarvis shows the operation of the clutch and throttle in response to a manual user input of a gear change decision. In response to that decision, the controller in Jarvis tells the clutch to disengage and further tells the throttle to close or go to a minimum position. This happens even though the driver may be holding the throttle demand steady by a steady pressure on the accelerator pedal. Jarvis subsequently reopens the throttle at a predetermined rate. [Jarvis col. 6 lines 9-33] Throughout the gear change operation, the throttle opening and the clutch engagement are regulated in Jarvis to facilitate the smooth engagement of the clutch. After the “kiss point” (T6), the load of the vehicle is effectively experienced by the engine. The vehicle then acts as a brake on the engine. [Col 7 lines 5-14] When the target torque transmitting capacity “T” is attained (T6), the torque transmitting capacity of the clutch is increased at a lower rate, as shown at 124. [Col. 7, lines 15-23] Also throughout the gear change operation, the controller is determining a time T7 at which to reopen the throttle at a pre-determined rate until the throttle opening corresponds to the user input at the accelerator of throttle demand. [Col. 7 lines 29-40] Jarvis does not teach or suggest what this predetermined rate is or how it is set.

Jarvis nowhere suggests or teaches that the rate of clutch engagement should be determined from a throttle opening parameter value. The throttle values shown graphically in Figure 3 are

determined by the controller in response to (1) the user input of a throttle demand (ie; the depression of the accelerator pedal, not an parameter related to the actual opening of the throttle), the user input of a gear shift command, and (3) the response of the drive system under its loaded condition. The clutch engagement in Figure 3 is also determined by these factors, independent of the throttle opening parameter values. As best can be determined from the specification, the clutch engagement rate shown in segment 124 of Figure 3 is independent of any throttle opening parameter value.

Jarvis fails to teach the methods of Claims 7, 9, 16 and 18 listed above which are not supplied by Wheeler: (1) setting an operating mode of the clutch based on a throttle operating parameter; (2) altering the rate of engagement in response to a throttle operating parameter; and (3) including an operating mode of a clutch at a first rate below a first threshold level and at a second rate above the first threshold level.

Therefore neither Jarvis nor Wheeler, nor any combination of these references, teaches or suggests engaging a clutch at an increasingly aggressive rate when a throttle operating parameter value is increasing, as claimed in Claims 7, 9, 16 and 18. Accordingly, Applicants submit that for at least this reason, these claims are allowable over Wheeler and Jarvis.

In addition, each of claims 7, 9, 16 and 18 has at least one additional detail which further distinguishes it from Wheeler and Jarvis. For example, claims 7 and 16 claim an operating mode including engaging the clutch at the first rate when the throttle operating parameter value is substantially equal to the first threshold value and Claims 9 and 18 an operating mode including claim engaging the clutch at the first rate when no throttle operating parameter value is determined. Neither of these details are taught or suggested by either Wheeler or Jarvis. For at least this additional reason, these claims are allowable over Wheeler and Jarvis.

Appropriateness of combining *Wheeler & Jarvis*

Furthermore, applicants respectfully assert that it would not be obvious to combine Wheeler and Jarvis. Wheeler and Jarvis are directed to solving different problems for different clutch systems under different operating conditions. In particular, Wheeler is directed to providing an “urge to move” feel at idle conditions in a master dry clutch system of an automatic transmission. [See for example, Wheeler col. 1 lines 47-54] In contrast, Jarvis is directed to the control of a clutch and throttle in a manual transmission system during a manual gear shifting operation. [See for example Jarvis Abstract and col. 2 line 67 –col. 3 line 3]

There is no suggestion, motivation or reason in either Wheeler or Jarvis or in the knowledge generally available for combining these references which clearly have address distinct problems and provide distinct teachings and requirements for solving those problems. It is inappropriate to combine these references in any manner to reject claims in the present application.

For this additional reason, it is respectfully submitted that Claims 3 and 12, as amended, are patentable over Wheeler and Jarvis.

CONCLUSION

Reconsideration and allowance of the claims as now presented are respectfully requested. In view of the above amendment and remarks, applicant believes the pending application is in condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

It is believed that any fees associated with the filing of this paper are identified in an accompanying transmittal. However, if any additional fees are required, they may be charged to our Deposit Account 07-2347, under Order No. 65856-0075 from which the undersigned is authorized to draw.

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